وزاره التعليم العالي والبحث العلمي

كليه المستقبل الجامعه

قسم الفيزياء الطبيه

مختبر الميكانيك 2

مرحله اولى

Boyle's Law experiment

اعداد :م.ساره حامد دانه

The aim of Experiment: Boyle's Law Investigation and Measure the pressure of the atmosphere.

Apparatus: 1-A ruler of metric scale . (100cm)

2-Glass tube connected with a closed plastic tube at the end .

3-Liquid mercury (Hg).

□Theory:

*Boyle's law states that, for constant temperature, the product of the volume and the pressure of an ideal gas is a constant.

*PV=C…… (1)

*The ideal gas law PV=nRT …… (2)

*states that this constant (nRT) is proportional to the amount of ideal gas in the sample (the number of moles, n).

*The absolute temperature, T.

*The constant R in this equation is the universal gas constant which has a value of R=8.31 J/(mole.K) in SI unit.

*Note that if T is held constant throughout the experiment, then the ideal gas law reduces to Boyle's law.

*An experiment to investigate Boyle's law is carried out with the apparatus shown in the digram.

*The pressure and volume of the gas (air) trapped in the closed end can be varied by raising or lowering the other end.

*By measuring the difference in levels of mercury in the two tubes the pressure of the gas in the closed end can be calculated.

*The volume of gas in this end can be calculated by assuming that the glass tube is a cylinder.

Diagram of Experiment:

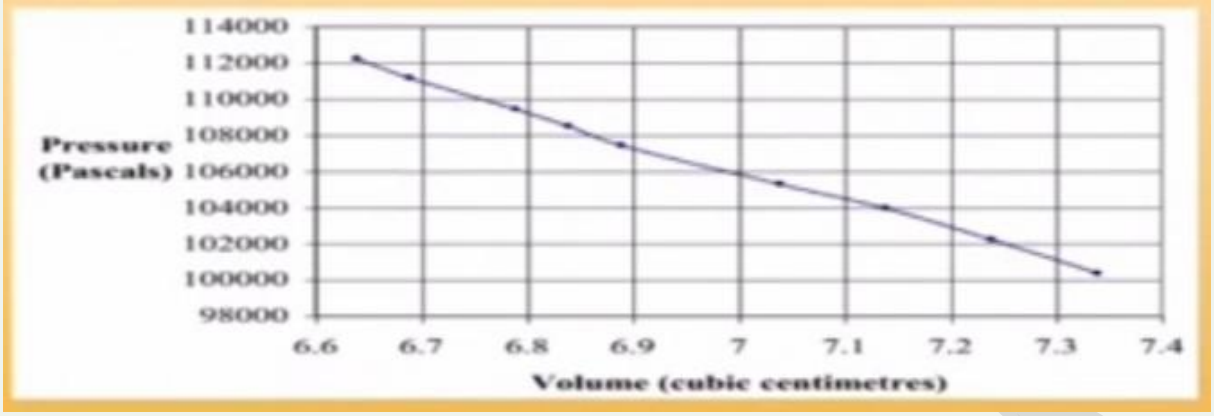

Table of reading :

h(cm)	L cm	1/L (cm^{-1})	P=ρgh	V(cm^3)
0	12			
5	11.5			
10	11			
15	10.5			
20	10			

Results and your calculation :

P=ρgh ..... (1)

ρ= density of Mercury (Hg)= 13600Kg/m^3

1mm.Hg =132.3 pa .

g= 9.8 m/sec^2 or =10 m/sec^2

v=4π^2 L